VANE PUMP WITH MOVABLE SLEEVE

The invention belongs to the domain of positive displacement machines for liquids with rotating cylinders F 04 B 1/10 and positive displacement machines for liquids F 04 C 2/22.

The core of the invention is to put a movable sleeve into a vane pump, which enables regulation of the fluid flow.

Fig. 1 is partial cut view drawing of the pump

Fig. 2 represents various arcs in the pump

Fig. 3 represents compensation of various arcs in the pump

Pump can be used in all applications where variable fluid flow is required

Pump (Fig. 1) comprises of casing (1), rotor with vanes and shaft (2), movable sleeve (3), two lids (4), two end stops (5) and two supports (6 and 7).

Movable sleeve (3) has two apertures (a) and two circulation channels (b) which may be either in the casing (1) or partially in the casing (1) and partially in the sleeve (3). Since it is obvious that the arcs (m and n) are unequal (Fig. 2) it is necessary to overcome this disparity in the moment when vanes are approaching the aperture (a). Solution to this problem is obtained by one end of each aperture being slanted (Fig. 3). When the sleeve moves axially, the vanes will reach the aperture (a) earlier or later. The apertures (2) have the opposite ends slanted.

Axial movement of the sleeve (3) results from guidance of the inclined surface on support (6).

Sleeve (3) can move angularly (arcuately) to change the fluid flow. Regardless of the rotational direction of the rotor, by turning the sleeve for the full circle (in any direction) the fluid flow is changed from zero to maximum in one direction and then through zero to maximum in the opposite direction and finally to zero again.

Rotor (excluding vanes) should not touch the sleeve.